

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 4, 10-12, 14, 15, 19, 21, 22 and 24 as follows.

Please cancel claims 3, 13, 16, 17 and 20 without prejudice.

1. (Currently amended) An apparatus, comprising:

an electrode including a tapered end, wherein the tapered end has an angle between approximately five and thirty degrees; and

a piezoelectric material of an acoustic resonator disposed over the electrode.
2. (Original) The apparatus of claim 1 wherein the piezoelectric material comprises Aluminum Nitride (AlN), Zinc Oxide (ZnO), or lead titanate zirconate (PZT).
3. (Cancelled)
4. (Currently amended) The apparatus of claim 1 wherein the electrode comprises at least one of aluminum, gold, chromium, platinum, and molybdenum.
5. (Original) The apparatus of claim 1, further comprising a top electrode adjacent to a second side of the piezoelectric material, wherein the electrode is a bottom electrode adjacent to a first side of the piezoelectric material.

6. (Original) The apparatus of claim 5, further comprising a substrate layer under the bottom electrode.
7. (Original) The apparatus of claim 6, further comprising a dielectric layer between the substrate layer and the bottom electrode.
8. (Original) The apparatus of claim 1 wherein the tapered end is formed through a wet etching process.
9. (Original) The apparatus of claim 1 wherein the acoustic resonator is a film bulk acoustic resonator (FBAR).
10. (Currently amended) A film bulk acoustic resonator (FBAR), comprising:
 - a bottom electrode including a tapered end;
 - a piezoelectric layer layered on the bottom electrode, wherein a surface area of the bottom electrode is less than a surface area of the piezoelectric layer; and
 - a top electrode positioned on top of the piezoelectric layer wherein at least a portion of the piezoelectric layer is disposed between the bottom electrode and the top electrode.
11. (Currently amended) The ~~apparatus~~ FBAR of claim 10, further comprising a substrate positioned under the bottom electrode.

12. (Currently amended) The ~~apparatus~~ FBAR of claim 10 wherein the tapered end has an angle between approximately five and thirty degrees between a flat bottom side of the tapered end and a sloped upper side of the tapered end.

13. (Cancelled)

14. (Currently amended) The ~~apparatus~~ FBAR of claim ~~13~~ 10 wherein at least a portion of a parameter of the bottom electrode includes the tapered end.

15. (Currently amended) A method, comprising:
forming a metal layer on top of a dielectric layer; ~~and~~
placing a photoresist layer on top of the metal layer; and
shaping the metal layer to form a tapered electrode of an acoustic resonator, wherein
shaping the metal layer comprises wet etching the metal layer to form the tapered electrode.

16. (Cancelled)

17. (Cancelled)

18. (Original) The method of claim 15 wherein the tapered electrode has an angle between approximately five and thirty degrees.

19. (Currently amended) An apparatus, comprising:
a piezoelectric layer of an acoustic resonator; and
means for preventing cracks in the piezoelectric layer, wherein the means for preventing cracks comprises a bottom electrode including a tapered end positioned under the piezoelectric layer.
20. (Cancelled)
21. (Currently amended) The apparatus of claim ~~20~~ 19 wherein the tapered end has an angle between approximately five and thirty degrees.
22. (Currently amended) The apparatus of claim ~~20~~ 19 wherein the acoustic resonator is a film bulk acoustic resonator (FBAR).
23. (Original) The apparatus of claim 22 wherein the piezoelectric layer comprises Aluminum Nitride (AlN), Zinc Oxide (ZnO), or lead titanate zirconate (PZT).
24. (Currently amended) A system, comprising:
a film bulk acoustic resonator (FBAR) filter, comprising:
a bottom electrode including a tapered end, wherein the tapered end has an angle between approximately five and thirty degrees; and
a piezoelectric material layered on the bottom electrode; and
a transmitter electrically coupled to the FBAR filter.

25. (Original) The system of claim 24 wherein the piezoelectric material comprises Aluminum Nitride (AlN), Zinc Oxide (ZnO), or lead titanate zirconate (PZT).

26. (Original) The system of claim 24 wherein the system is a wireless device.